Chapter 10

Enterprise Information Systems

Chapter 10 Outline

- 10.1 Enterprise Systems
- 10.2 Enterprise Resource Planning (ERP)
- 10.3 Supply Chain Management (SCM)
- 10.4 Collaborative Planning, Forecasting & Replenishment (CPFR)
- 10.5 Customer Relationship Management (CRM)
- 10.6 Knowledge Management (KM)

Chapter 10 Learning Objectives

- [illegible] enterprise systems support cross-functional and multi-national operations.
- Understand why companies need enterprise resource planning (ERP) systems.
- Describe supply chain management (SCM) networks and solutions.
- Understand collaborative planning, forecasting, and replenishment (CPFR).
- Describe customer relationship management (CRM) systems.
- Discuss benefits of knowledge management (KM) systems.

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Legacy Systems

- Companies have many of the database and software apps that they had invested in over the past several decades.
- These old **legacy systems** have been built with various outdated technologies. Regardless of their limitations or age, a company's legacy systems may be **mission-critical**.

Legacy systems are *inflexible* and *expensive to maintain* because they:

1. cannot be updated or be updated without significant effort, cost, and risk
2. cannot interface (connect to) and exchange data with newer IT or do so without significant effort, cost, and risk

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10.1 Enterprise Systems

- Enterprise systems are a top issue in IT management and corporate strategy because of their potential to increase both the *top line* (net revenues) and the *bottom line* (net income)

- They integrate the functional systems that you read in Chapter 9—
  - accounting, finance, marketing, and operations.
- Integration achieved by linking DBs & DWs so they can share data with:
  - 1-internal functions, or the **internal supply chain**
  - 2-external partners, or the **external supply chain**

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Key types of enterprise systems

- ERP: Enterprise Resource Planning
- SCM: Supply Chain Management
- CPFR: Collaborative Planning, Forecasting, and Replenishment
- CRM: Customer Relationship Management
- KM: Knowledge Management

Implementation challenges of enterprise syste

The greatest challenges when implementing enterprise systems are not the technical ones. Biggest challenges are *process and change management.*

1. **Re-design of business processes.** Processes need to be simplified and re-designed so that they can be automated, either totally or partially.
2. **Changes in how people perform their jobs**. Jobs and how they are performed will change to accommodate the new processes.
3. **Integration of many ISs.** Integrating ISs is necessary so that data can flow seamlessly among departments and business partners.

10.2 Enterprise Resource Planning (ERP) Systems

- **ERP:** infrastructure that links an enterprise’s internal applications and supports its external business processes, e.g., Under Armour
- ERP apps are modular, and modules are integrated with each other to expand capabilities
- Managers can stay informed of what’s going on in other departments that impact their operations or performance.
- ERP can create a competitive edge

Characteristics of ERP Applications

- Bring silos of information together to enable managers to better understand what is going on
- Provide information access, integrated business processes, and modern technology platform to become and remain competitive
- Support all, or most, of a company's business functions and processes

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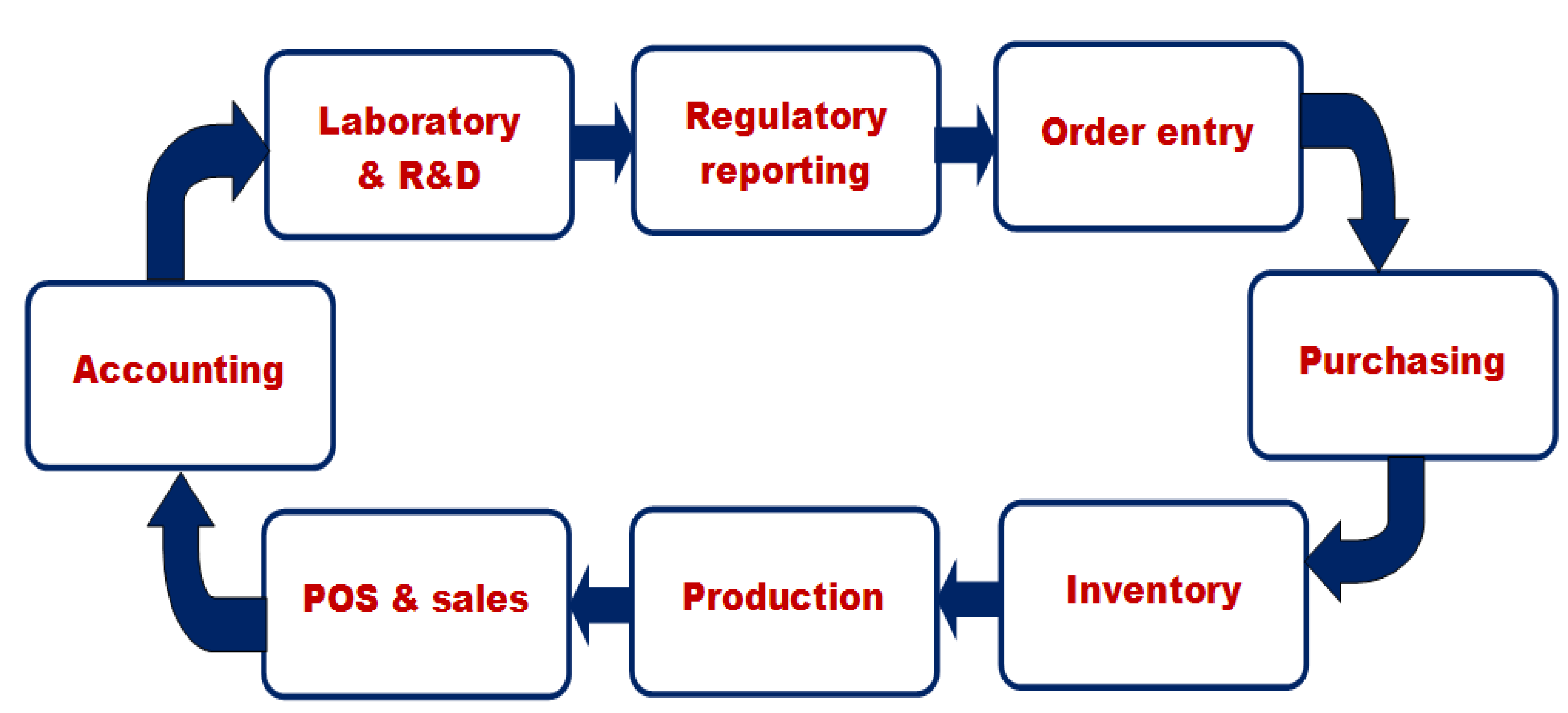
ERP system

integrates all function ISs of a food manufacturer's around a single set of data



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Single point of control

- ERP gives manufacturers a single point of control for data thereby:
  - eliminating the need to enter data in multiple systems
  - reducing common data entry errors and costs
  - allowing for the posting of transactional data in real-time for instant access to up-to-date information.
  - being able to respond quickly to food recalls
  - meeting requirements of the Bioterrorism Act or other regulations for accurate record keeping in order to support the discovery and quick response to food chain supply threats

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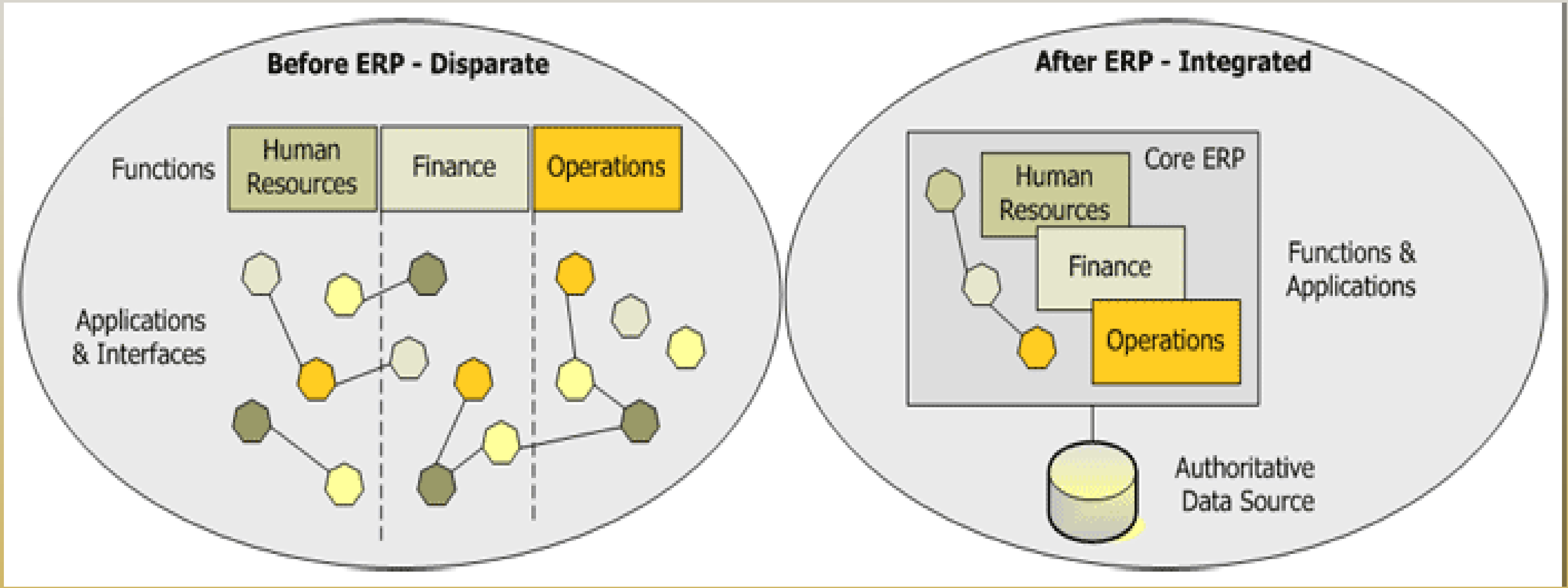

Figure 10.3. Comparison of disparate systems within an enterprise to an integrated ERP system.
Courtesy of U.S. Army

ERP interfaces with legacy applications through an **enterprise application integration (EAI)** layer, and with external business partners through a **B2B gateway**

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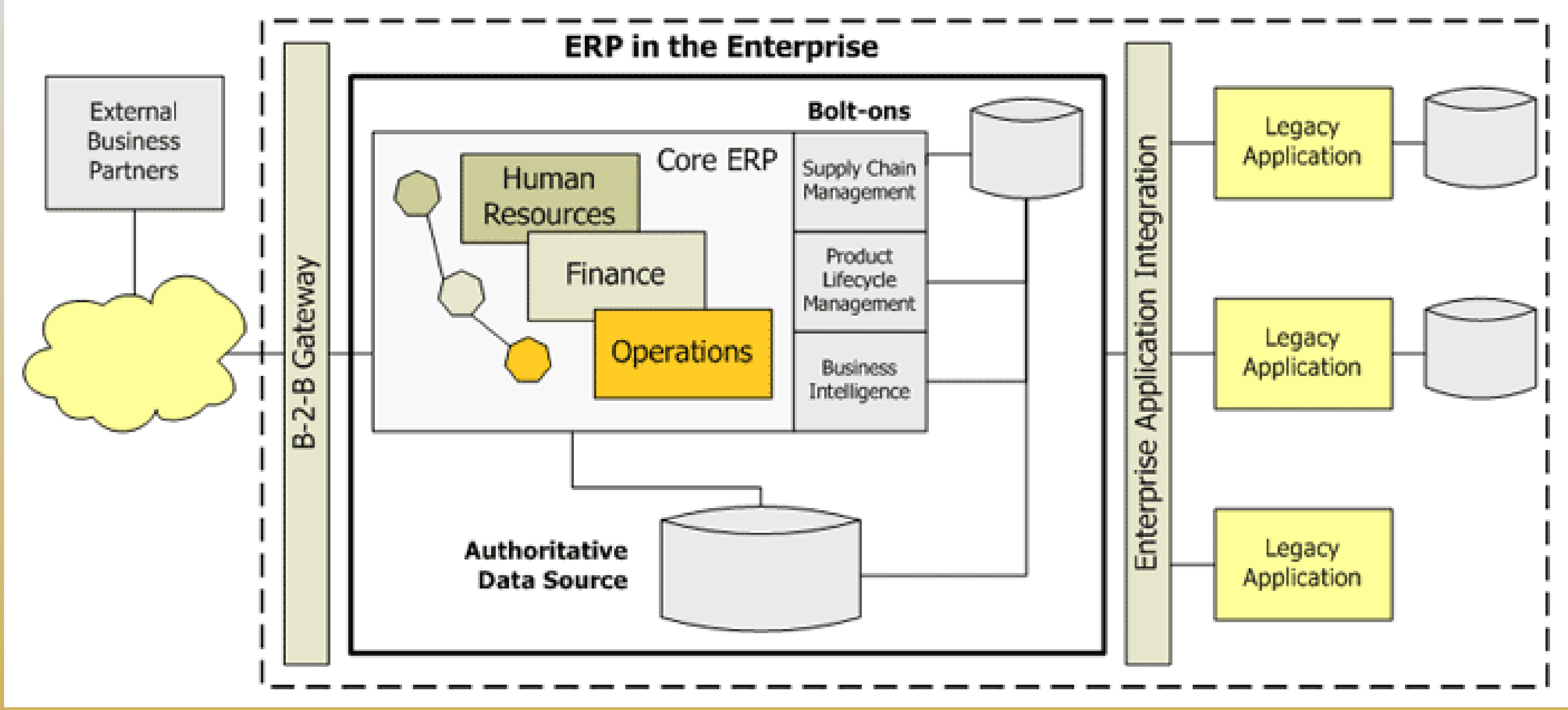

Figure 10.4. How ERP interfaces with other enterprise systems. Courtesy of U.S. Army Business Transformation Knowledge Center, *army.mil/armyBTKC/*

B2B gateways provide a backbone for the secure exchange of data, files and documents—*intra-company & w/ external parties*

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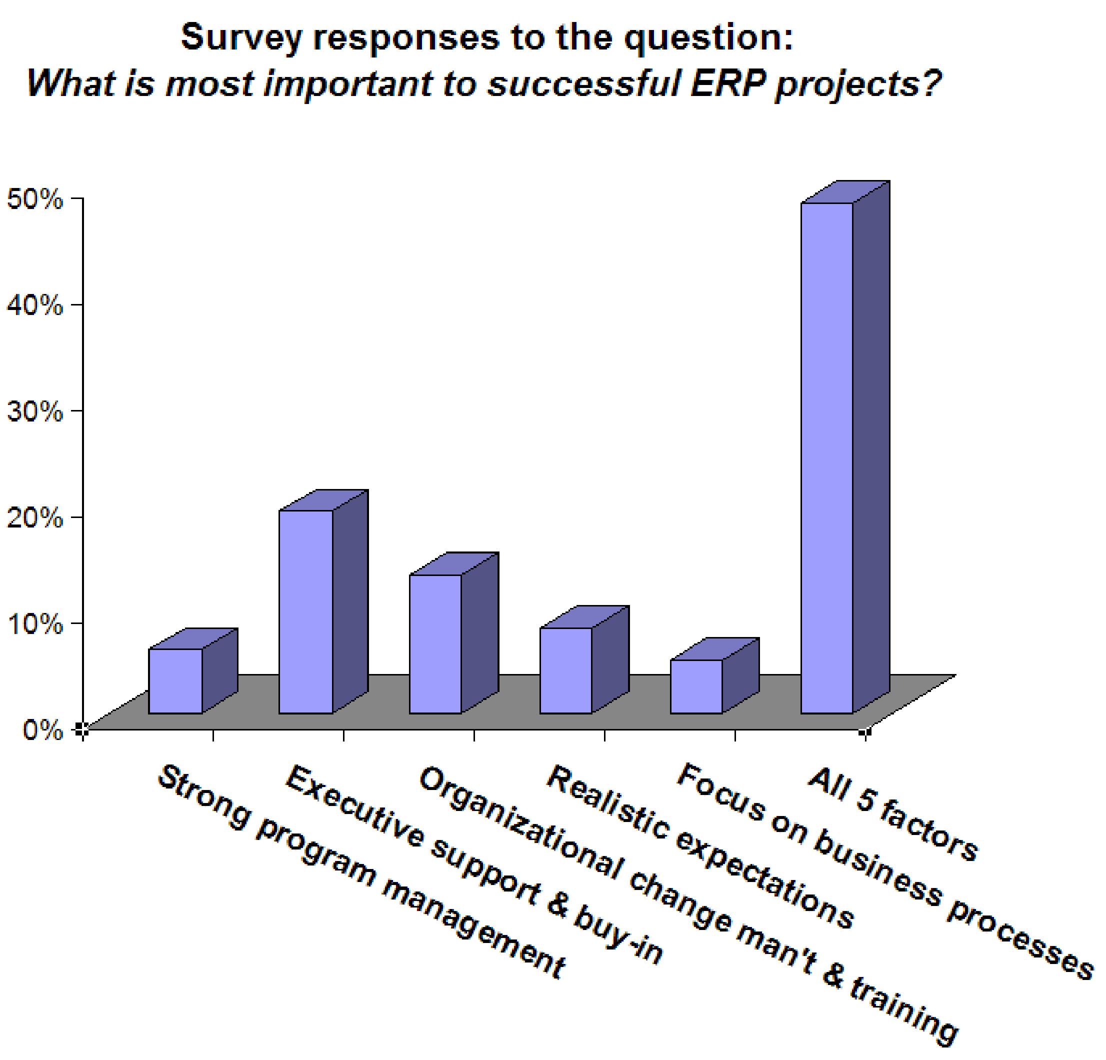

Figure 10.5 Experts identify what's most important to the success of an ERP

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ERP acquisition and vendors

- Typically, ERP systems are acquired by purchasing or leasing packaged software.
- Current major ERP vendors are the following. Note that acquisitions continue to consolidate the industry.
    - **Oracle**, *oracle.com* which acquired PeopleSoft and JD Edwards
    - **SAP**, *sap.com*
    - **SSA Global**, *ssaglobal.com/* which acquired BAAN
    - **Microsoft Dynamics**, *microsoft.com/dynamics/en/us/default.aspx*

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Cases of ERP Failure

- **Hershey's** spent 3 years implementing a $115 million ERP system with SAP, Siebel, and Manugistics. The ERP was to replace all legacy systems and to integrate inventory, production, order processing, payroll, accounting, and finance. Hershey's devastating mistake was trying to implement all systems in all departments at the same time.
- **Nike** implemented i2's (*i2.com*) demand and supply planner software. The i2 system created duplicate orders, deleted customer orders, and deleted manufacturing requests to Asian factories. Adding to the problems, the ERP was not designed to handle Nike's large number of products.
- **FoxMeyer's** ERP could not process the transactions needed to supply their customers with their orders. FoxMeyer had been processing 425,000 invoice lines per day on their legacy software. Their ERP was limited to 10,000 invoice lines per day. This decreased order processing capability quickly put the company into bankruptcy protection and ultimately shut down the business.

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10.3 Supply Chain Management (SCM) Systems

Supply chain: a pipeline of companies that perform any of the following functions:

- procurement of materials
- transformation of materials into intermediate or finished products
- distribution of finished products to retailers or customers
- recycling or disposal in a landfill

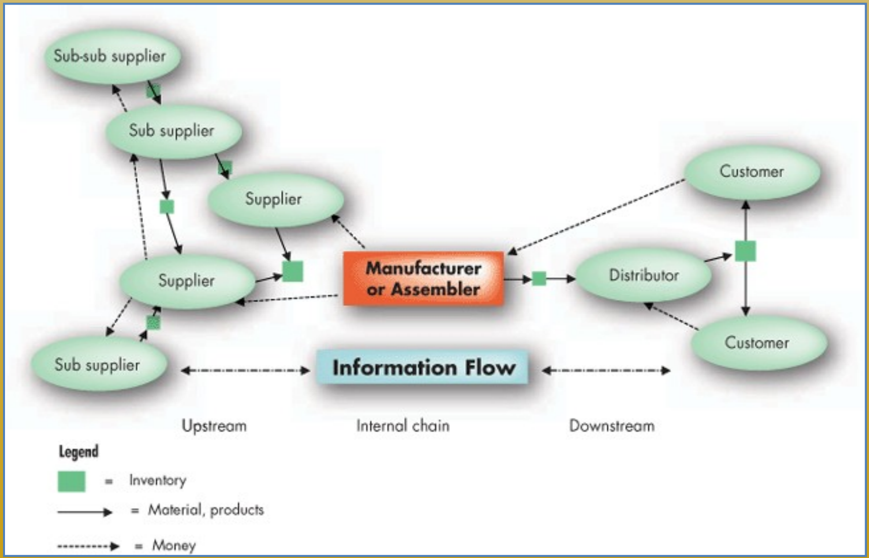

Figure 10.6 Structure of a supply chain

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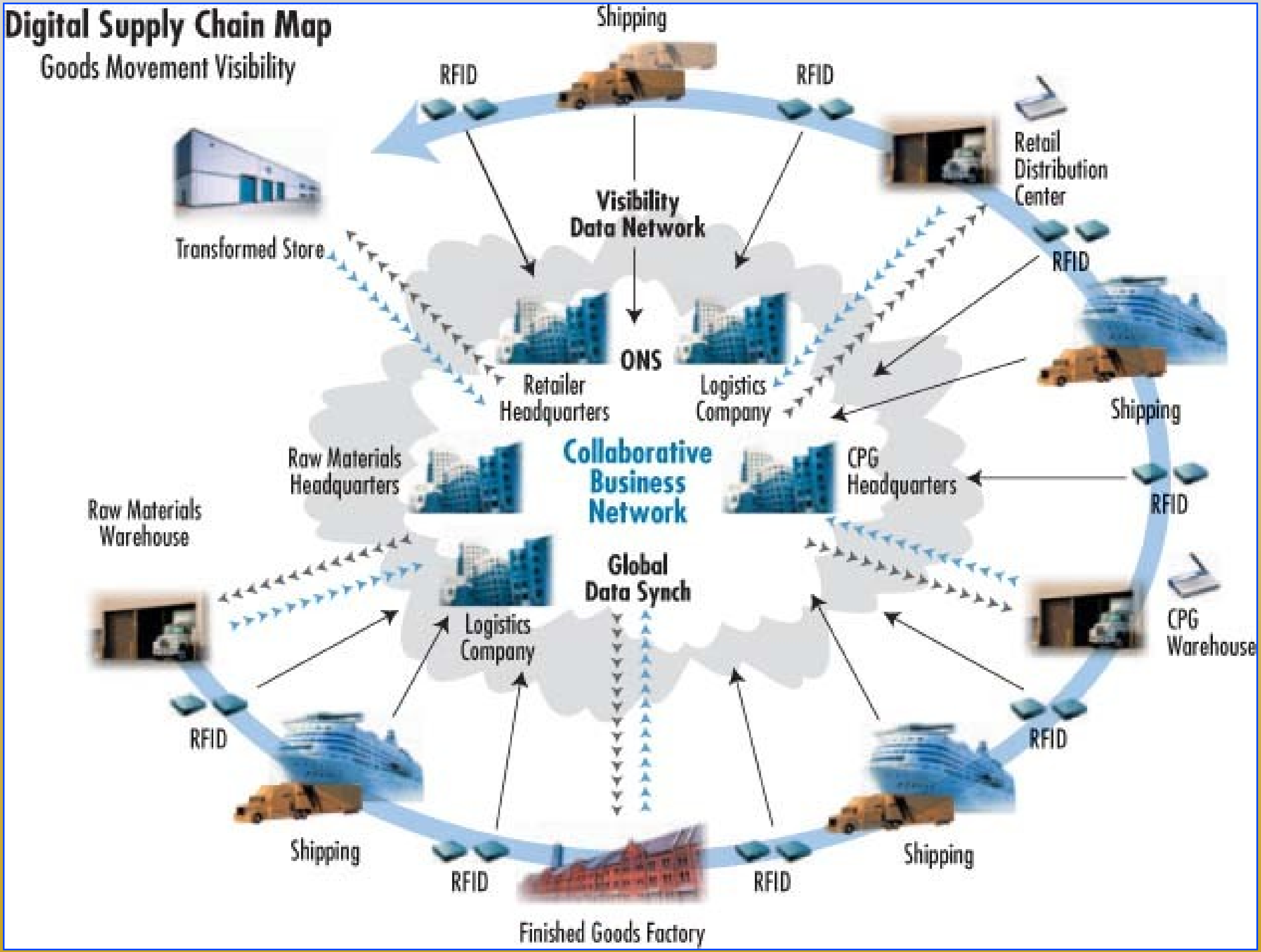

Figure 10.7 Managing a supply chains with RFID

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Managing the Flow of Materials, Data, and Money

- **Material or product flow**: For example, chipmaker Intel supplies computer chips to its customer Dell. Dell supplies its computers to end-users. Products that are returned make up what is called the **reverse supply chain** because goods are moving in the reverse direction.
- **Information flow**: Movement of detailed data among members of the supply chain, e.g., order information, customer information, order fulfillment, delivery status, and proof-of-delivery confirmation.
- **Financial flow**: Transfer of payments and financial arrangements, e.g., billing payment schedules, credit terms, and payment via **electronic funds transfer (EFT)**.

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Order fulfillment is the set of complex processes involved in providing customers with what they have ordered on time and all related customer services.

- Order fulfillment depends on the type of product/service and purchase method (online, in-store, catalog, etc).
- E.g., a customer who orders an appliance via the *Sears.com* Web site needs to receive it as scheduled, with assembly and operating instructions, and warranty and return information.

Logistics : "the process of planning, implementing, and controlling the efficient and effective flow and storage of goods, services, and related information from point of origin to point of consumption for the

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10.4 Collaborative Planning, Forecasting, and Replenishment (CPFR) Systems

- In the late 1980s, P&G convinced Wal-Mart to implement its continuous replenishment software. P&G continuously replenished Pampers baby diapers at Wal-Mart stores.
- **Continuous replenishment** is a supply chain relationship in which a vendor continuously monitors the inventory of a retailer or distributor and automatically replenishes their inventory when levels hit the re-order point.

CPFR

- **Is a set of data-driven business processes designed to improve the ability to predict and coordinate with supply chain partners.**

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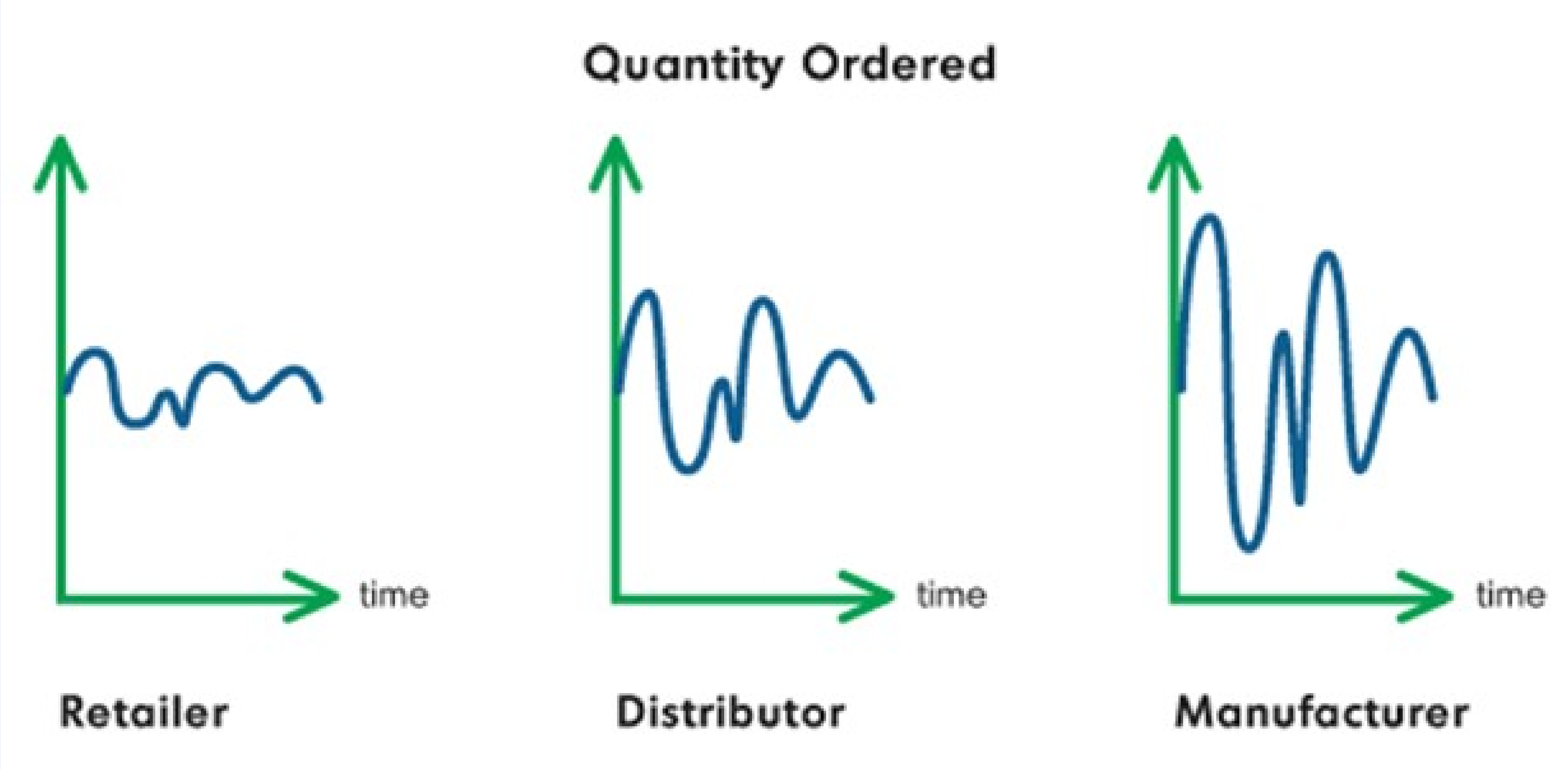
Figure 10.8. Bullwhip effect



Bullwhip effect occurs when companies significantly cut or add inventories. Economists call it a *bullwhip* because even small increases in demand can cause a big increase in the need for parts and materials further down the supply chain.

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4 main CPFR activities

1-Strategy and Planning:

- Setting the ground rules for the collaborative relationship and specifying the product mix.

2-Demand and Supply Management:

- Forecasting consumer demand and order and shipment requirements over the planning horizon.

3-Execution:

- Performing activities, such as placing orders, shipping and delivery, receiving, stocking, tracking sales transactions, and making payments.

4-Analysis:

- Monitoring outcomes of planning and execution, assessing results and key performance metrics, sharing insights with partners, and adjusting plans as needed.

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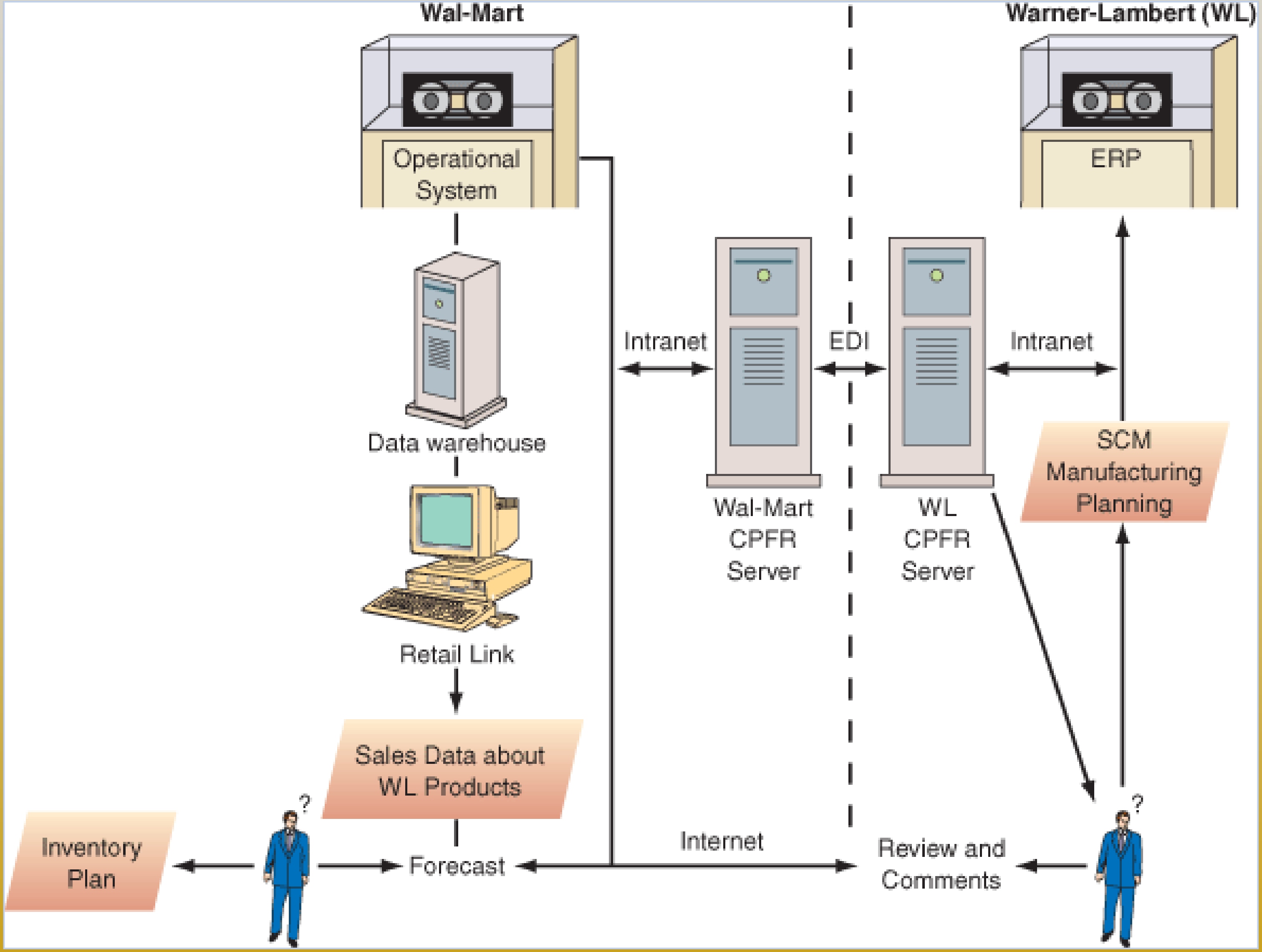

Figure 10.9. Model of CPFR

Some Challenges for CRM

- **Attracting new customers** is expensive, e.g., it costs banks roughly $100 to acquire a new customer.
- Newly acquired customers are unprofitable until they have **purchased enough** products or services to exceed the cost to acquire and service them.
- **Retaining customers** that generate profits (revenues in excess of the costs) is critical—and *the reason for CRM.*

According to management guru Peter Drucker:
Those companies who know their customers, understand their needs, and communicate intelligently with them will always have a competitive advantage over those that don't.

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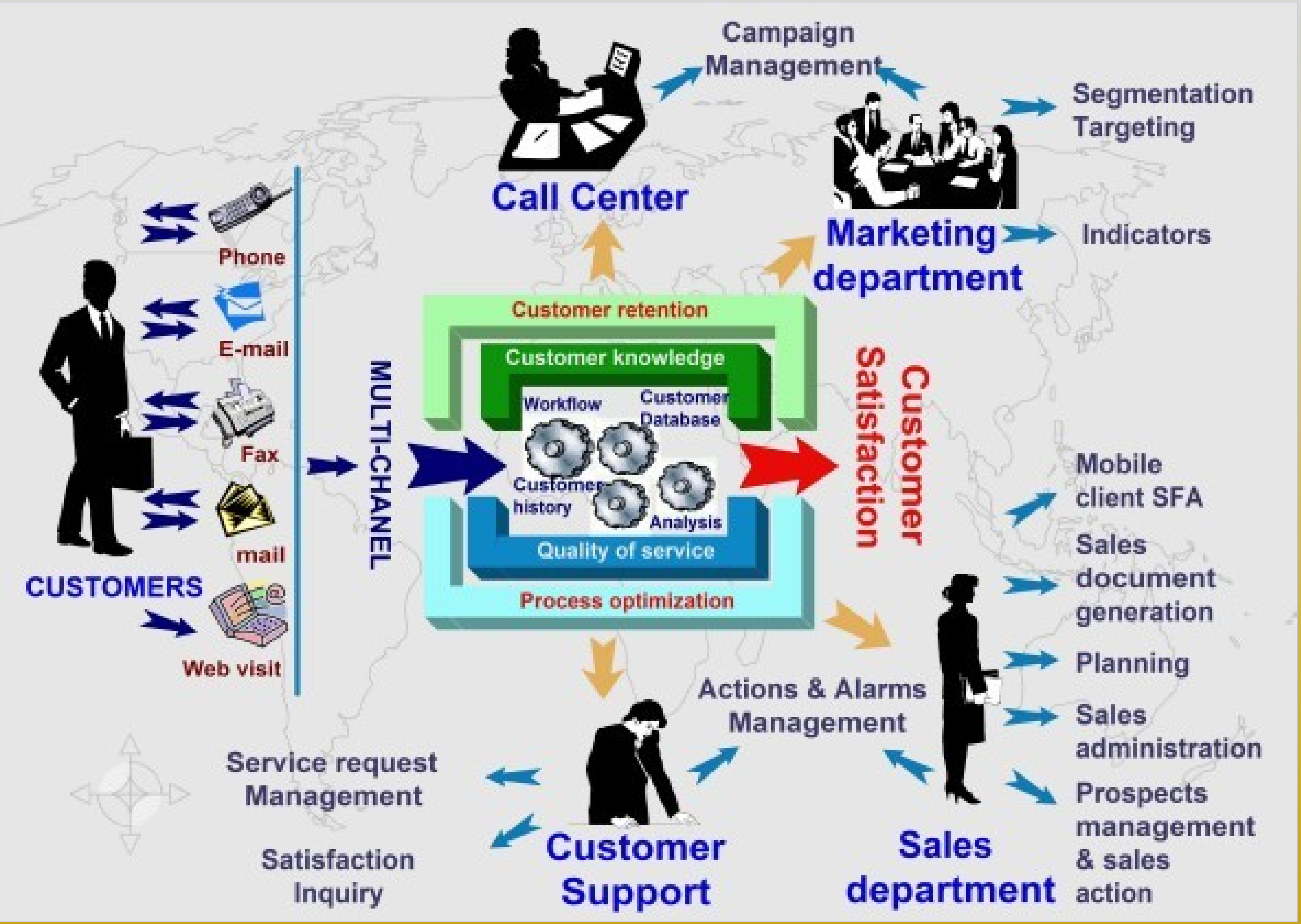

Figure 10.10. CRM

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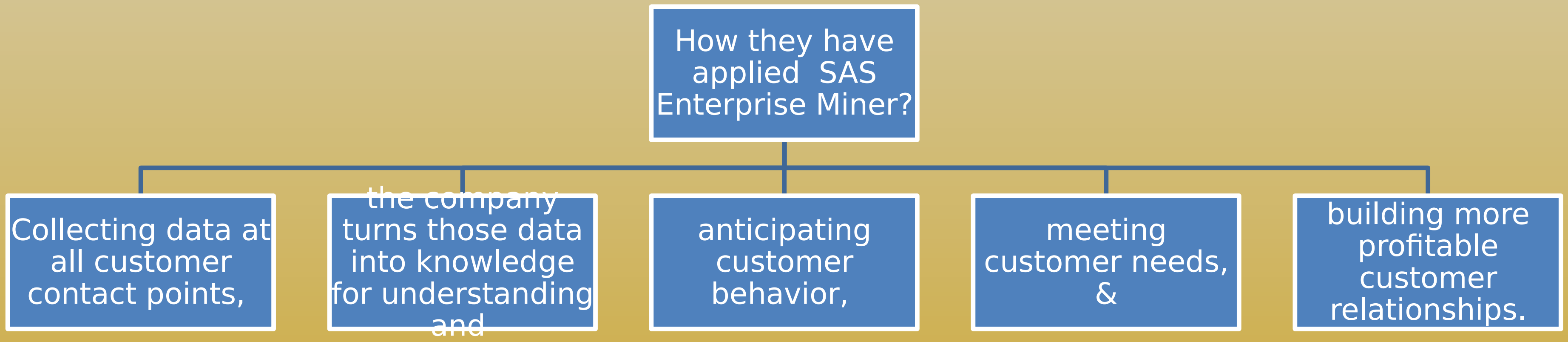
IT at Work 10.4 : ***1-800-Flowers.com Uses Data Mining for CRM***

The company decided to cultivate brand loyalty

- Using **SAS Enterprise Miner,** 1-800-FLOWERS.COM
  - Sifts(filter) through data (such as historical purchases) to discover trends, explain outcomes, and predict results so that the company can increase response rates and identify profitable customers.



Main goals for a Miner:

- In addition to selling and campaign management
- the ultimate goal is to make sure that when a customer wants to buy,
  - he or she continues to buy from 1-800-FLOWERS.COM and
  - cannot be captured by a competitor's marketing.

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On-Demand CRM (utility computing / SaaS)

- *On-demand CRM* is CRM **hosted by a vendor** on the vendor's premise, (in contrast to the traditional practice of buying the software and using it on site).
- *Salesforce.com* pioneered the concept for its CRM products, including supporting salespeople with *On-Demand CRM* offered over the Internet.
- *On-demand* is known also as *utility computing* or *software as a service* (SaaS).

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10.6 Knowledge Management (KM) Systems

Knowledge

- 85% of a company's *knowledge* **is not stored** in databases.
- Knowledge is **dispersed in social media**, e-mail, texts, intranets, Word documents, spreadsheets, and presentations on individual computers and mobile devices.
- Knowledge typically is **unstructured**, and has strong **experiential** and **reflective** elements.
- Having knowledge **implies** that it **can be used to solve** a problem, whereas having information does not imply that ability.

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Knowledge management (KM)

KM

is a process that helps organizations identify, select, organize, disseminate, and transfer important information and expertise that are part of the organization's memory.

KM systems

KM systems identify, capture, store, maintain, and deliver useful knowledge in a meaningful form to anyone who needs it, anyplace and anytime, within an organization.

KM systems support sharing, decision making, and collaborating at the the organization level regardless of location.

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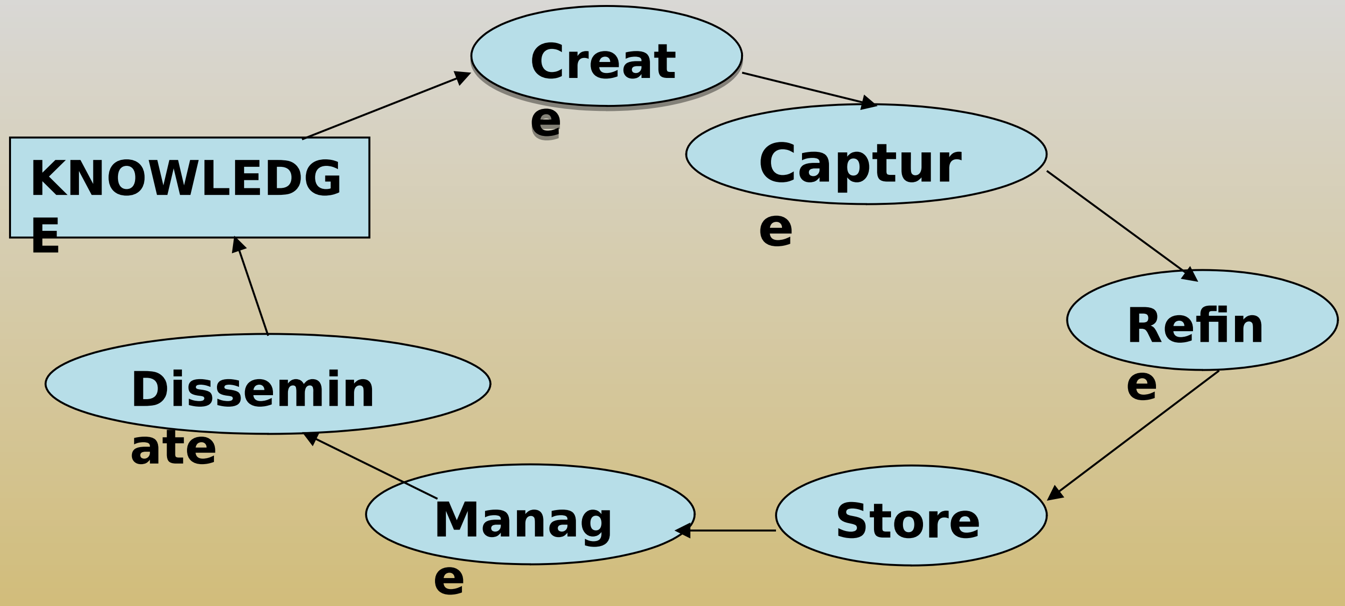
KM Systems Cycle



1. Create knowledge. Knowledge is created as people learn new ways of doing things

2. Capture knowledge. New knowledge is represented in a reasonable way

3. Refine knowledge. New knowledge is put into context

4. Store knowledge. Useful knowledge is stored so that others can access it

5. Manage knowledge. Knowledge must be kept current and accurate